

U.S. DEPARTMENT OF COMMERCE / Environmental Science Services Administration

WELCOME ABOARD!



USC&GSS McARTHUR

CGC 30



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A message from the captain:

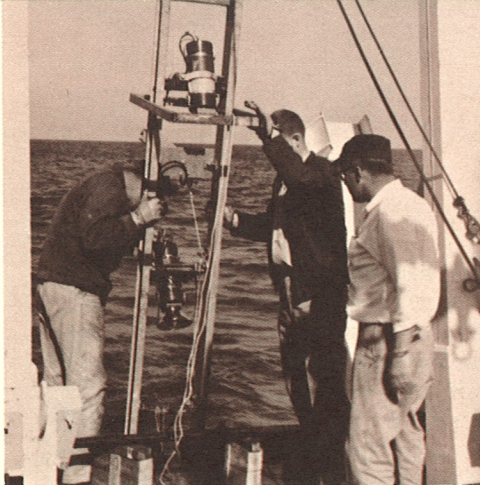
On behalf of the officers and men of the *USC&GSS McArthur*, I would like to take this opportunity to welcome you aboard. I hope your visit will be both enlightening and enjoyable.

Oceanography is one of the fastest-growing and most productive research activities in the world today. I am sure that you will leave our ship today with a greater appreciation for, and knowledge of, this complex science.

The officers and crew of the *McArthur* are at your disposal and will gladly answer any questions concerning the ship and her activities.

Sincerely,

Ronald L. Newsom
LCDR, USESSA



A deep-water camera is lowered to photograph small sections of the ocean floor.

ESSA commissioned officers at work in the *McArthur's* plotting room.



The USC&GSS *McArthur* is one of a fleet of research and survey vessels used by ESSA, the Environmental Science Services Administration, to improve man's understanding and use of the physical environment. Coastal Survey Ship (CSS) 30 is operated by the Coast and Geodetic Survey, a major element of ESSA, and commanded by officers of the ESSA Commissioned Corps.

The *McArthur* is 175 feet long with a 38-foot beam and a displacement of 995 tons. Her primary function is hydrographic and coastal surveying, a task for which she is superbly equipped. Echo-sounding equipment aboard the *McArthur* can measure ocean depths from shoal water to 36,000 feet. The ship's position at sea can be established with high precision with the two electronic navigation systems. A Decca "HI-FIX" navigation system can pinpoint the ship's position to within plus or minus three feet at a range of 100 miles. A self-tracking Loran-C navigation system automatically prints out ship's position while the *McArthur* is underway. The *McArthur's* radar gives true or relative motion reflections of prominent objects for a radius of 60 nautical miles. Navigation aids also include a gyro compass.

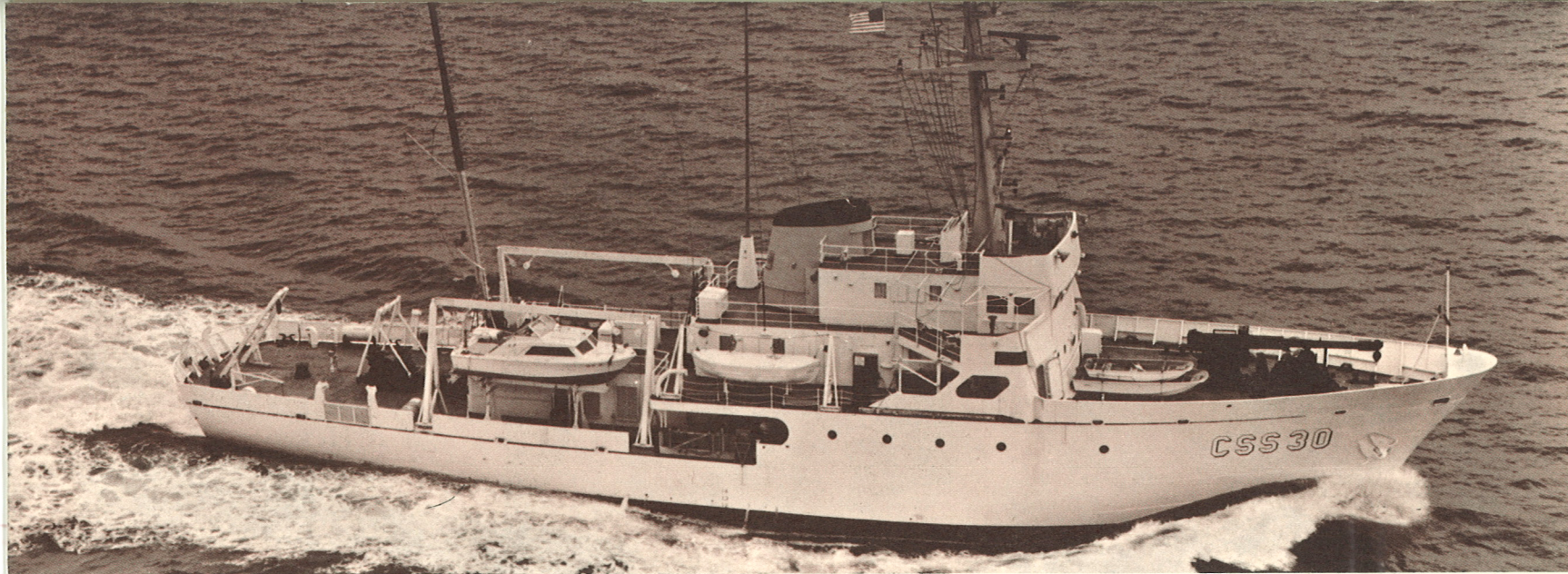
The *McArthur* carries two fully equipped, 25-foot survey launches equipped with "HI-FIX" and depth-recording systems for precise survey operations.

Although hydrographic surveying is her

principal mission, the *McArthur* is equipped to handle sophisticated oceanographic research projects. During her geophysical survey of the continental shelf off Florida's east coast, the ship obtained gravity and magnetic data, seismic reflection profiles (which show geological structure beneath the ocean's sediment-covered floor), deep-water current observations, and photographs of the ocean floor.

The *McArthur* has a fully equipped oceanographic laboratory, where sediment cores and water samples are stored and analyzed. Oceanographic equipment includes Nansen bottles for gathering water samples at depth; bathythermographs, to measure water temperature as a function of depth; a velocimeter, to measure the velocity of sound in water; and deep-water current meters, which are suspended from ship-launched buoys and measure the direction and speed of sub-surface currents. Geophysical equipment includes a magnetometer, which measures and records the intensity of the earth's magnetic field, a seismic reflection profiler, and a gravity meter which is lowered to the ocean floor to measure the strength and direction of the earth's gravity field.

The *McArthur* has a range of 4,500 nautical miles at a sustained speed of 13.5 knots. Her ice-strengthened steel hull permits polar operations, and she is fully air-conditioned for comfort and efficiency in warmer lati-



tudes. The ship is driven by two 800 SHP diesel-electric engines, each driving a variable-pitch propeller that can be controlled from the pilot house, engine room, and an aft steering station. Two multipurpose oceanographic winches and one bathythermograph winch are carried by the *McArthur*.

The USC&GSS *McArthur* was designed by the U. S. Maritime Administration and built under its supervision by Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., where she was commissioned December 15, 1966.

The home port of this \$2.4 million research and survey vessel is Honolulu, Hawaii. From that base, the *McArthur* will sail to working grounds around the South Pacific and along the coast of Alaska, to help gather the knowledge man must have to understand and use the global sea.

The USC&GSS *McArthur* is named for Lieutenant William P. McArthur, who began his Coast and Geodetic Survey career in 1840 aboard the brig *Consort*, then engaged in surveys of the Gulf coast. In 1848, he com-

manded a hydrographic party sent to make the first survey of the Pacific coast. This pioneering work, which included preliminary surveys and successful reconnaissance of the coast from Monterey to the Columbia River, was carried out under the handicaps of McArthur's recurring attacks of malignant fever, and the gold fever of his crew. McArthur died in 1850. His great-granddaughter, Mrs. Jack K. Bennet of Portland, Ore., christened the ship named for him in November 1965.



Velocimeters are lowered to measure the speed of sound in water—a variable that affects the accuracy of sonar soundings.



A current meter is launched and will soon be followed by the buoy shown on deck. Once in position, the buoy/meter system will broadcast current velocity to the ship.



Coring devices gather cylindrical samples of the ocean's sediment floor.

General Description

Length, overall	175	feet
Beam, molded	38	feet
Draft, full load	12	feet
Displacement	995	long tons
Service Speed	13.5	knots
Range	4,500	nautical miles
Endurance (provisions)	15	days
Complement	36	

OCEANOGRAPHY AT ESSA

Formation of ESSA in 1965 brought together the functions of the Coast and Geodetic Survey and the Weather Bureau, which became two major elements of the agency, and created the Environmental Data Service, National Environmental Satellite Center, and Institutes for Environmental Research. The Central Radio Propagation Laboratory, formerly of the National Bureau of Standards, became the Institute for Telecommunication Sciences and Aeronomy, joining the Institutes for Earth Sciences, Atmospheric Sciences, and Oceanography.

The Coast and Geodetic Survey and Institute for Oceanography are the principal oceanographic elements of ESSA, and the interplay between the two is readily apparent. Much of the Institute's work is laying the foundation of future, routine operations of the Coast Survey; and the geophysical, oceanographic, and marine geological data gathered during survey operations are studied by Institute scientists.

Both organizations participate in national and international oceanographic programs, and encourage the joint participation of guest scientists from private institutions, universities, and government agencies. The Institute maintains field facilities in co-location with Coast Survey activities, as for example, the Pacific Oceanographic Laboratory at the Coast Survey's Pacific Marine Center in Seattle, Washington, and the Land-Sea Interaction Laboratory with the Coast Survey's Atlantic

Marine Center in Norfolk, Virginia. The Institute also maintains small, specialized research groups; at present, these include the Joint Tsunami Research Effort, with the University of Hawaii, the joint Oceanographic Research Group, with the University of Washington, and the Sea-Air Interaction Laboratory. The objective here has been to foster productive environmental research, both as a Federal sponsor and as a full member of the scientific community.

The USC&GSS *McArthur* is important to both the service and research aspects of ESSA's oceanographic program. The ship's hydrographic surveys will contribute to improved nautical charts, and safer Pacific commerce. Geophysical and oceanographic data obtained by the *McArthur* will be used in the construction of a new series of detailed bathymetric maps—an essential preliminary to successful exploitation of the sea's resources.



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